

GERMINAL IDEAS AND PROCESSES WITHIN *PLIES* (2002)

A CHAMBER WORK FOR ELEVEN PLAYERS

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The piece is a twenty minute work discoursing the integration and eventual dissolution of two separate musical strands. The pitch material of each strand is determined from synthetic scales whose intervallic content duplicates at the following intervals: Perfect 12<sup>th</sup>, Diminished 12<sup>th</sup>, Minor 9<sup>th</sup>, Perfect 8<sup>ve</sup>, and Major 7<sup>th</sup>. A proportional means of temporal compression is generated through the use of the factor, 11/15 (e.g. Event 2 is 11/15 the duration of Event 1).

Various elements of jazz music informed the construction of *plies*, including the instrumentation of the ensemble and the means by which the performers interact throughout the piece. Internal cueing and performer decisions are meant to eliminate the need of a conductor in favor of increased interpretive freedom by the performers.

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## **GERMINAL IDEAS AND PROCESSES WITHIN *PLIES* (2002)**

### **Context: Musical Momentum in General and in *plies* Specifically**

One of the primary objectives of the music of any era is the control of momentum. As drastically as Western music has changed over the centuries, this is one element that seemingly cannot be avoided. Momentum refers to the musical forces which drive a piece forward and provide a sense of pacing. Even such pieces as Riley's *In C* (1964) and Cage's *4:33* (1952), which for the most part deal in realms very different from almost all other music, still relate back to a sense of momentum. Momentum relates to the sense of temporal progression and to the segmentation of music into specific forms, large and small. It must take into account listener expectations, both those informed externally by the culture and practice of the day and internally by the events within a particular piece of music. Ultimately this idea of momentum is tied to the time-dependent nature of music. Whereas the rigid nature of time is inflexible, musical momentum is not. To describe the momentum within a piece of music is to speak of perception of time as the piece proceeds: how time ebbs and flows outside of the strict mathematical ticking of a clock.

The ways in which momentum is generated and manipulated are as varied as there are compositional techniques and musical aesthetics. The sense of linear progression resulting from the use of repetition in Baroque music is one example: the sequences, the ritornello forms, the fugues. The harmonic variation in the Development section of a Classical Sonata is another example. The insistence of dominant to tonic resolution in common practice harmony is yet another. Momentum can be dictated as part of surface elements such as voice leading or rhythmic figures and it can also be driven as part of

deeper elements such as harmonic motion and key changes. On still a deeper level, abstract elements such as process or formal patterns play a role in momentum. The purely graphical notation of Earle Brown's *December 1952* from *Folio* (1953) is an extreme example of this last case.

Similarly, *plies* is constructed from an idea whose momentum is carried in the process that the piece describes. The process specifically is one of decay. What begin as two separate, distinct musical strands in *plies*, become one undifferentiated strand as the piece progresses. However, the process of eroding away the unique elements of each strand takes on a momentum that continues until, in the end, every bit of musical material has decayed into nothingness. The discourse of the piece deals specifically with the manner in which this momentum is driven and how it in turn manifests itself on the musical materials.

### **Basics of the Piece**

*Plies* is a chamber work for eleven players. The ensemble consists of flute, clarinet, alto saxophone, trumpet, trombone, two percussionists, violin, viola, cello and contrabass. The general sound quality of the ensemble is more closely modeled after a jazz band sound than a classical chamber group sound. The brightness of the saxophone and brass, the lack of double reeds, the presence of the contrabass to fill out the low end of the texture and the prevalence of suspended cymbals throughout help reinforce this association. One notable exclusion from the instrumentation is piano. It does not fit well into either of the two main groupings, melodic instruments and percussion instruments, as those roles are defined in this piece. The piano's inability to sustain and, more importantly, to shape sustained notes precludes its inclusion among the melody instruments. Since the percussion battery intentionally does not contain any pitched instruments, a piano would not fit into that group either. Thus to incorporate effectively a piano into the texture would have required the creation of an instrumental role that would detract from the overall scheme rather than enhance it.

The instruments comprising the percussion battery can be grouped into three categories: skins, metals and woods. The skin percussion instruments were chosen for their high degree of resonance and include bass and tenor drums as well as tom-toms. Of all the percussion instruments, the tom-toms play the most critical role in delineating form (this will be described in further detail later). The metals are represented predominantly by suspended cymbals, which provide a sheen of white noise over the top of the ensemble. The woods are played exclusively by the second percussionist and take



on the role of countermelody to the tom-toms. As with the skins, resonance was the primary factor in selecting the wood instruments. The most frequently used member of this group is the slit drum.

Ideally, the work is to be performed without a conductor. The score is meant to encourage interpretive freedom by the individual players. Entrances, timings and interactions within the ensemble can vary drastically from one performance to another. As a result, the duration of any particular performance is indeterminate. Generally though, the piece will last in the range of eighteen to twenty minutes.

## **Fundamental Elements**

Before beginning a formal analysis of *plies*, three elements basic to its composition need to be addressed: (1) the two musical strands comprising the piece, (2) the synthetic scales upon which the pitch material is derived and (3) the compositional process of temporal compression. These elements are fundamental building blocks for the work.

### **Two Musical Strands**

As stated above, two separate musical strands are present throughout the piece. The structure and momentum of the piece are driven by the interaction of these two musics. At first they are completely distinct and share no common ground. In the end they are undifferentiated. The course of the piece follows the gradual coming together of these two musics to the point at which they are no longer independent. Then, beyond that point, the process of identity loss continues unabated until each of the remaining musical elements has been eroded and nothing else is left but silence. For the sake of simplicity, these musics will be referred to as Y material and X material.

The Y material is metered music written in standard notation and characterized by a strong linear drive. This music is not necessarily melodic. The term “melodic” carries with it connotations of theme and motive which do not apply to this material; hence the term linear is the best description. Independent lines are the norm rather than a more traditional texture of melody, harmony and counterpoint. The X material is unmetered, written in "box" style notation, and tends to consist of pedal points. The musical interest of this material is driven more by color and dynamic contrast than by any sort of linear

motion. As the two musics meld into one, these descriptions become less valid.

However, they are meant to represent generalizations of the ideals for each.

## **Scales**

The music is derived from ten different synthetic scales, five for the Y material and five corresponding scales for the X material. Unique to each pair of scales (one each for X and Y) is its interval of duplication. The standard diatonic major scale consists of a series of intervals which repeat each octave, thus its duplication interval is an octave. For purposes of this discussion, intervals of duplication will be notated in terms of the number of semitones within that interval. For example, the major scale mentioned above would be notated as base-12 given that an octave spans twelve semitones. The scales used in *plies* are base-19, base-18, base-13, base-12 and base-11, or alternatively the scales duplicate at the perfect twelfth, the diminished twelfth, the minor ninth, the octave and the major seventh, respectively.

In describing the scales, the term "pitch class" is used in the abstract sense. For instance in a base-13 scale, the root pitch is considered pitch class 0. In the octave where this pitch class is represented by a D#, it is duplicated above by the pitch E and below by the pitch D. Each of these pitches is a representative of the pitch class 0 for purposes of this discussion, not pitch class 3, 4, or 2 as they would be commonly known in a base-12 scale. Hence, the base-13 scale consists of pitch classes 0 through 12. The base-19 scale consists of pitch classes 0 through 18 and so on.

The primary characteristic common to each of the scales is that the root tone is approached from above and below by a minor third. This feature provides a certain



particular scale. Through a technique modeled after common-tone modulations in tonal music, these changes of root and corresponding changes of pitch environment are accomplished via close modulations.

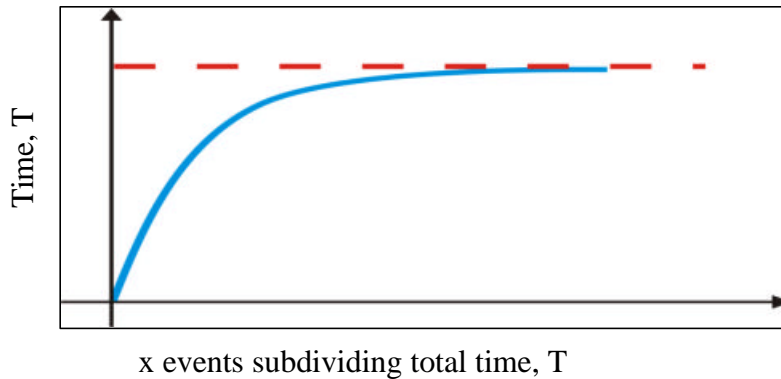
Appendix B contains a set of matrices showing all possible transpositions of each of the five X material (primary) scales. These matrices show the number of PCs shared by the original and the transposed scales. Those transpositions resulting in the greatest number of common pitches were utilized in the piece and represent the "close modulations" inherent in each pitch environment. The same transposition intervals apply to the Y material as well given that the interval content in the Y scales is a strict inversion of the X scales. This idea is explored in further detail later in the paper.

### **Temporal Compression**

Many of the relative durations within sections of *plies* were determined using a proportional method of compression. The ratio of 4:15 was utilized in many instances throughout the piece to calculate durations. Given the total duration of a musical gesture, the first event within that gesture would span 4/15 of the total. The second event would span 4/15 of the remaining 11/15 and so on. For example, given a section of music lasting sixty seconds, the first event would span sixteen seconds (4/15 of 60). The second event would span 11.7 seconds (4/15 of the remaining 44 seconds). The third event would span seven seconds and so on. In other words, each event is 11/15 the length of the event immediately preceding it. The process can be represented mathematically by the equation,  $f(x) = T - T (11/15)^x$  where T is the total duration of whatever is being

subdivided and  $f(x)$  is the duration from the start of the section (time = 0) to the end of the  $x$ th event. Figure 2 shows a graphical representation of the equation.

Figure 2: Graph of  $f(x) = T - T(11/15)^x$  and its asymptote,  $g(x)=T$



The end result of this procedure is a series of proportionally decreasing durations creating a sense of temporal compression. This procedure is used in controlling both large and small scale elements of the form and as a means of manipulating the momentum of the piece. In some instances, the quantity of music diminishes as the amount of time available for each event decreases resulting in a rapid deceleration of momentum. The Y material throughout the B section undergoes this compression procedure. The section is subdivided into ten subsections. The sixth through the ninth of these are thirteen, ten, seven and five seconds long, respectively. Measures K-29 through L-11 comprise the end of the sixth subsection through the end of the ninth. The beginning of this excerpt is a dense, rapidly moving passage highlighted by frenetic percussion activity. As the durations of the subsections diminish, so does the activity level of the music involved. This excerpt ends with a fragment of a quiet, lyrical duet between the violin and trombone.

Conversely, at other times, a building of momentum is achieved by keeping the quantity of music consistent across subsequent blocks of time so that as the duration of each block diminishes, the density of the musical material increases. Measures F-19 through F-27 provide an example of this. Here in the A section, the total length is subdivided into separate chords of decreasing duration. As the duration of each subsection decreases, the music becomes more compressed and the resulting denseness increases. Specifically in this example, the music begins with a simple dotted rhythm figure in the viola. However, the texture quickly takes on more complicated gestures including triplets in the viola and trombone and unmetered flurries in the bass and trumpet. Finally, this excerpt culminates with the asymmetrically accented quintuplet figures from the highest tom-tom.

A pure, mathematical application of this compression ratio is in actuality a practical impossibility. Were the 4:15 ratio for determining durations applied precisely, then no section could ever have enough events within it to account for that section's total duration. The graph of this equation shows a curve whose slope increases rapidly as  $x$  approaches zero. However, as  $x$  increases in value, the slope levels off so that the horizontal line  $g(x) = T$  serves as an asymptote, a ceiling that the function can never quite reach no matter how many events are placed within the overall duration (see Figure 2, above). Two solutions were developed in order to translate the mathematical ideal into a manageable technique for controlling relative durations.

The first solution utilizes the 4:15 process to determine the durations of all but the last event within a section. This last event is then assigned all of the time remaining up to

the end of the section. The second solution keeps each of the sections in the correct proportion by setting the asymptote of the equation at some point greater than the section's total duration. The actual value of the asymptote is then merely a function of the number of events within the section. Examples of each of these techniques will be presented later.



## Two Differing Perspectives on the Form

The form of *plies* can be described in two different manners depending on perspective and the criteria used for determination. On one hand, from a more traditional, formal perspective, the piece can be described as having a circular form: a sort of ABA with coda. From a functional perspective, the piece can be described as having a linear form. Dividing the piece into two parts, body and coda, will help illustrate the differences in these viewpoints. The body consists of all the music up until Rehearsal Letter V and comprises the base-19, base-18, base-13 and base-12 pitch environments. The coda consists of all the music thereafter and its pitch material is derived from the base-11 scales.

Over the course of the body, ten distinct pitch environments are utilized. Changes from one to the next involve either a modulation of scale root or a change of the duplication interval, but never both. The environments are listed below in Figure 3. The use of these distinct environments points up the dual forms of the piece. Supporting the circular (ABA) structure is the fact that the first and last sections of the body begin on a scale rooted in Db which duplicates at a perfect interval. Supporting the linear structure is the process by which both the X and Y material gradually lose the pitch class exclusivity which defined their structures. After the initial A section, certain scale steps begin to cross over to the other musical strand. The last column of Figure 3 below shows this.

For the former reason, the body can be divided into four sections: A-B-C-A'. The durations of each of these sections were determined using the 4:15 ratio process resulting in A lasting 5:20, B lasting 3:55, C lasting 2:52 and A' lasting 2:06.

Figure 3: The ten pitch environments in the body of the piece

Environment	Scale	Root	Section	Measures	Est. Duration	Shared Scale Steps
1	Base-19	Db	A	A1-E10	3:16	
2	Base-19	F	A	F1-G16	2:04	
3	Base-18	F	B	H1-II7	1:28	6
4	Base-18	Ab	B	I18-J37	1:05	6
5	Base-18	B	B	K1-K32	0:47	6, 3
6	Base-18	E	B	L1-M	0:35	6, 3
7	Base-13	E	C	N1-P16	1:39	6, 3, 4
8	Base-13	Db	C	P17-S	1:13	6, 3, 4
9	Base-12	Db	A'	T1-T61	1:26	6, 3, 4, 2
10	Base-12	Bb	A'	T62-U23	0:41	6, 3, 4, 2, 5

### Formal Design (Circular Form)

From a formal viewpoint, the four-part form of the body (A-B-C-A', as established above) has each of its sections demarcated by (1) the interval of duplication unique to its own scale and (2) the manner in which the linear generation of music is derived. The latter will be discussed in the section below on processes. Further, given the number of similarities between the B and the C sections, it could be argued that these are actually just two parts of one large B section. The form then could more generally be described as A-B-A, pointing up the departure and return aspect of the work.

### Beginning and Ending Sections, A and A' (mm. A1 - G16 and T1 – U23)

The Y material in sections A and A' is characterized by independent, disjunct lines. Here the resulting texture is a more important element than the path traversed by any individual line. Many sections are filled with multiple voices speaking at once with the intent of avoiding a sense of a primary line with accompaniment. Melodic leaps are frequent in each of the lines and the inevitable changes of timbre that result from these

register changes diminish the sense of distinguishing individual lines. Instead, what results is a complex texture characterized by continuous internal motion.

The A and A' sections were composed using identical procedures. In effect, A' is a denser, more compressed version of A. Compositionally, the starting point for each is a chaconne-like procedure which dictates the moment-to-moment pitch possibilities.

Applying the idea of tonic, subdominant and dominant harmonies to the synthetic scales in sections A and A' results in three distinct "chords," notated as i, ii and iii. These chords are not intended to function as tonic, subdominant and dominant harmony. They are only intended to serve as a systematic means of bringing out certain characteristics of the synthetic scales by isolating specific sets of intervals in the vertical domain and certain voice leading tendencies in the horizontal (e.g., the minor 3<sup>rd</sup> step from above or below to the root of each scale). The scale steps associated with each of these chords are as follows.

i:	1, 3, 5, 7
ii:	1, 3, 4, 6, 8
iii:	2, 4, 6, 7, 9

A harmonic pattern of i-ii-i-iii is stated repeatedly in these sections establishing a chaconne-like process. This pattern is stated seven times generating a total of twenty-eight different "chords." The exact pitch material was determined through the use of a computer algorithm programmed in QBasic. This process served as a series of filters through which the output of a random number generator was passed. The results were pitch collections grouped by instrument which conformed to the prevalent harmony as well as the tessitura specified for each instrument. The pitches within each collection

were then organized in a linear manner supporting the compositional requirements of the piece as it progressed. Example 2 is from Section A where the “chord” changes from ii to i within the overall Pitch Environment 1 (see Appendix A). Each pitch is labeled with the scale of which it is a member (X or Y) as well as the scale step it represents. A carat above the scale step signifies that the pitch is a “non-chord tone.”

Example 2: Section A excerpt with scales and scales steps labeled (mm.D11-D15)

The duration of each of the seven repetitions of the chaconne pattern is derived from the 4:15 ratio described above. For instance, in the A section, the durations of each repetition are 85, 63, 46, 34, 25, 18 and 50. The last repetition breaks the pattern by taking up the entire length of the time remaining to the end of the section. The durations of the four chords present in each repetition are also determined using the 4/15 idea, though in a different way. Rather than having each chord be of proportional duration, the

entire length of the repetition is thought of as being subdivided into fifteen equal lengths. The four chords then are allocated 4/15, 4/15, 4/15 and 3/15 of the total. So in the case of the first repetition of the chaconne idea in the A section, the 85 seconds is subdivided into three chords of 23 seconds followed by one of 17 seconds (these durations are rounded to the nearest integer value).

Inherent in base-12 scales is the fact that the interval of duplication is also the least dissonant interval possible. In any other scale, this is not the case. That the only two scales in this piece which duplicate at perfect intervals are the ones underlying A and A' (perfect 12<sup>th</sup> and perfect 8<sup>ve</sup>, respectively) was useful compositionally in substantiating the "bookend" relationships of the outer sections of an ABA form. Each of the other scales used have the paradoxical feature that two pitches representing the same scale step in adjacent registers are dissonant, causing conflict between the functional role and aural perception. Example 3 shows an excerpt from the end of section C which demonstrates this feature. Here the trombone doubles the trumpet an "octave" below. However this is a base-13 "octave" creating strong dissonance where functionally there is no discord between the lines.

Example 3: trumpet and trombone duplicating at a base-13 "octave" (mm.R7-R11)



One last element of the music in sections A and A' which needs to be noted is the role of the tom-toms. Their presence is significant in that they function outside of both the X and the Y material. They are presented in specific metrical notation similar to the

Y material, but in terms of timing and momentum the tom-tom line runs completely independent of the Y material. The tom-toms also represent the only instances in the piece where the 4:15 ratio is applied in retrograde, creating a proportional expansion rather than compression. For simplicity, the tom-tom line will be discussed here only as it pertains to the A section, as its role in the A' section is merely a parallel of that in the A section.

Two places in section A were chosen as reference points: one 176 seconds into the piece, the other 252 seconds into the piece (mm. E-3 and F-27, respectively). The first is the location of the first of seven pauses in the Y material (see the section below on the B and C sections for details). The second point is approximately where the bass drops to the root of the scale after the piece modulates from Db down to F (i.e., from Environment 1 to Environment 2). From these points, the 4:15 procedure was used in retrograde to generate waves of expansion in both directions. This process is analogous to two stones being dropped simultaneously into water. Each stone creates a series of ripples whose magnitude diminishes as the distance from the source increases. However, instead of ripples forward and backward in space, these ripples move forward and backward in a field of time. As the distance in time between the starting point of any particular ripple and its source (either 176 or 252) increases so does the distance between events. The density of the tom-toms in the overall texture rises and falls in waves resulting from the interference of the two sets of ripples. Appendix C shows the spacing of the tom-tom entrances resulting from this process.

### **Middle Sections, B and C (mm. H1 – S)**

From compositional procedure to aural result, the middle sections of the body, B and C, are wholly different from A and A'. Whereas heterophonic or accompanimental textures were largely absent in the body's outer sections, here they are the norm rather than the exception. The Y material in these sections presents itself in a more traditional melody and accompaniment format. In fact, the Y material comprising the entire length of both sections consists of the fleshing out of a single line into foreground and background elements. Conceptually these middle sections can be thought of as one melody beginning in the contrabass and passed to the violin, then to the trumpet, and so on. As the melody traverses the ensemble, the roles of the other instruments change in relation to the melody. At various times the background instruments play countermelodies, accent important rhythms or harmonies, or even present simple doublings of the melody at certain intervals. The overall sense of the Y material throughout these middle sections is of a much more freely composed music than that which comprises the A and A' sections. The X material on the other hand moves in the opposite direction.

Whereas the X material in the outer sections (A and A') tends toward sustained pedal points and long, slow moving sonorities without any real sense of independent lines. In the middle sections though, the emphasis in the X material is on motion. While the vertical realm is still largely static—there are no real chordal or harmonic variations beyond changes of scale or modulation—the horizontal realm is now in flux. The linear independence is enhanced by the fact that these lines are not metered. There is no pulse

to synchronize events and each instrument is free to present its material without being bound by the pacing of other concurrent lines.

The compression ratio controls the timing of the subsections within B and C. However, the X material and the Y material are governed by differing terms. The Y material is treated in the same manner as it was in section A. In section B, it is divided into ten subsections, each shorter than the previous one, except for the last which takes on all the remaining time. This process is repeated by dividing section C into nine subsections. Each of these subsections is marked by a change in the instrument(s) stating the lead line. The X material consists of only seven subsections, which span the entire duration of both B and C. This reinforces the differences between the X and Y material. The Y consists of quick, detail-oriented material and the X is made up of broad, more generalized gestures. The opening of B and the closing of C mark the only time these two simultaneous compression procedures are in phase.

Both middle sections end with a drastic shift in texture. In section B the trombone and violin begin a duet that comes to an abrupt halt in mid-phrase. This is immediately followed by a pianississimo tutti section (*ad libitum*) full of percussive white noise and devoid of any sense of momentum. Near the end of section C this interruption occurs again, but this time the saxophone solo is halted by a wall of string harmonics with percussive white noise. What results in both cases is the juxtaposition of a highly driven texture and a completely static one.

This stasis has its roots in section A, where between measures E-3 and F-27 the 4:15 ratio is used to create a series of seven accelerating pauses in the momentum of the



Example 4: Last of seven pauses in section A (mm.F19-F22)

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In each case, within the sequence of pauses in the A section and at the ends of sections B and C, the music returns as abruptly as the pauses that interrupted the texture. This stasis idea is finalized in the coda where it comes as a fortissimo variation which will be discussed in further detail later.

### **Functional Design (Linear Form)**

Each of the elements of the form—the tom-toms, the stasis, the systematic reduction in duplication interval, the integration of pitch collections between the X and the Y material, the durational compression effect on the various sections, and so on—comes to completion by the time section A' ends. The arc described by this process has no resemblance to a circular form. The state of the music at the end of the body of the piece is, from a functional perspective, diametrically opposed to that at the beginning.

Thus the body of the piece functions as the vehicle for the coming together of the disparate elements into one. Thinking of this process of decay as having a certain momentum provides an efficient means of looking at the discourse of the work as a whole. The processes which eliminated the distinctions between the X and the Y material come to completion at the end of the body. But as the coda begins, these processes have already achieved a level of momentum which continues unabated. Now however, the targets of the decay are the elements of the music itself.

The tom-tom lines in the outer sections of the body and the stasis in the inner sections are the only two formal elements that exist outside of the X and Y material paradigm. The ways in which these two elements manifest themselves in the coda reinforce the perception of the piece as having a linear form. The coda is not a

superfluous tag providing a nice conclusion to a circular form; rather it represents the logical and inevitable conclusion of the piece. The coda places the body of the piece in a completely different light and in so doing makes a strong argument that it is perhaps, from a formal standpoint, the most important section of the entire work.

### **Coda**

The coda provides the first and only instance of the 4:15 compression ratio being applied in the spirit of its true form—no practical alternative is used to alleviate the problem created by the asymptotic compression curve. It is conceived as having twelve subsections, the duration of each being  $11/15$  the duration of the preceding one. Each subsection reiterates a variant of some fragment of the body of the piece and utilizes that fragment in continuing the momentum of decay. Each reiteration breaks down various elements of the identity of the source fragment. The piece ends with every musical parameter having been whittled down to nothingness. By the very nature of the processes of decay and the momentum inherent in them, no alternative solution is needed. By the time that the 4:15 procedure would result in subsections of such short duration so as to be musically impractical, the music itself has already given way to silence.

The scales used in the coda all duplicate at the major seventh: another example of how the coda functions to take a process (that seemingly has come full circle) past its natural ending point and into a process of decay. All of the scales in the body of the piece span at least an octave and gradually shrink from a perfect duplication interval through a couple of dissonant intervals and back again to a perfect interval at the octave.

The coda takes this process one step further by compressing the duplication interval further and into a dissonance, this time spanning less than an octave.

The first subsection of the coda is a variant of both the stasis texture from sections B and C and the material stated by the tom-toms in sections A and A'. It is a combination of material from all four sections of the body of the piece as well as the most dramatic presentation of metered and unmetered musical elements. The stasis idea which was presented earlier in an unmetered, *ad libitum* style is now notated metrically as pedal tones. The strictly rhythmic, metered style of the tom-toms is now presented in a tempo which is unable to sustain itself. In this subsection, the effect is one of time, as it was presented earlier, losing its grasp on the piece. Another significant difference is the fact that this statement of the stasis idea is presented as a *fortissimo tutti*—a wall of sound struggling to maintain its hold on regularity of pulse. From here, and throughout, the dynamic parameter begins its slide into nothingness.

The decay of the pitch material begins in the second subsection. While the course of the body completed the process of eliminating all pitch segregation between the X and the Y material, the pitch environments still were limited to the semitone intervals comprising the equal-tempered chromatic scale. In this subsection, glissandi and quarter-tones are introduced gradually, expanding the pitch environment to any and all frequencies. It begins with a steady tempo, but as the pitch content becomes muddier, the steadiness of the beat begins to weaken as well. A *ritardando* results just as in the first subsection, and by the end of the second subsection, time and pitch and dynamics have all been subjected to the momentum of decay.

Each subsequent subsection continues in a similar vein until finally nothing is left of the music. At times certain elements return—a regular pulse from the slit drum in the fourth subsection, the strong dynamic level in the fifth subsection—but they are short lived and soon recede into the rapidly decaying texture. All sense of forward motion in the music is eventually lost so that no single parameter of the musical texture is able to maintain a steady level. By the end of the coda, any resemblance of the music to its original source is on a purely abstract level. Even the drastic shifts from one subsection to the next that marked the coda's beginning no longer exist at the end. The subsections themselves are no longer differentiable. The momentum of decay which transformed two distinct musical strands into one comes to fruition and in the end is self-consuming.

## **Compositional Considerations and Conclusions**

This piece was constructed through the use of rigid, inflexible methods. The role of the computer in quantifying parameters, the mathematical precision of timing that results from the 4:15 compression process, the strict role and definitions of the pitch material and how they transform over the course of the piece all are indicative of this rigidity. However, the reasons for this were not to create a computer-precise final product, but rather to build a framework of limits. The goal was to use these rigid techniques to define the outer limits of what could pass as acceptable possibilities for each gesture at any moment within the piece. These techniques guide the discourse to its desired end. However, they also allow for freedom within these defined limits.

Over the course of the five years that this piece was in construction, it went through several incarnations. The ensemble as it was originally conceived was almost twice as large and at various times included an organ, a piano, a guitar and four clarinets in addition to what stands as the final complement of instruments. The use of theatrical elements was even considered in one of the earlier renditions—almost a necessity at that time given that there were more than two different musical threads running through the piece. The players gradually were to move around the stage and at structurally important moments their locations would place them in physical groupings on stage corresponding to the separate musics present at that moment. The idea was to allow the visual and sonic placement of events to help the listener segregate the various ideas happening simultaneously. Each of these earlier versions was eventually scrapped as it became apparent that the attempts at composing the details were carrying the piece further and

further away from its original design. The problem was that the original design was not yet clear in my mind. I had not formulated any real terms within which the music could develop.

At times I thought that the important idea was a concern for coloristic development (hence the unusual ensembles originally considered) or for harmonic exploration of the synthetic scales, or for the use of textural density, and so on. As the germinal ideas for this final version began to solidify, I realized that the overriding concern was based more on performance considerations than anything else.

Thinking of the ensemble as a small jazz combo helped finalize many of the decisions that made starting the final version feasible. The traditional classical music archetype with its rigid rhythmic structure and its reliance on one leader did not fit into the concept of this piece. The idea of a conductor especially ran counter to the desired goal. Jazz music with its expandable forms and internal cueing provided the best model for how this piece should proceed. Missing however was the history and tradition inherent in jazz performances that provide the boundaries of acceptable possibilities. Without realizing it, many of the processes of determining this piece's limits had already been started in the work done on the previous versions: the means of determining temporal compression, of devising the synthetic scales and their manipulation, of transforming multiple musics into one.

Testing and developing these into usable methods was all that remained before they could be incorporated into the compositional processes of the piece. In the end these methods function as the "history and tradition" of *plies*. They dictate the limits of any

compositional or performance decision. Within the framework they provide, any number of possibilities can be explored—which is exactly the advantage that the jazz combo has over the symphony orchestra and the aspect I most wanted to bring out in this piece.

Where the architectural design of the piece calls for a certain section to last a specific number of seconds, this is only a guideline. For the most part, the borders from one section to the next are soft and the distinctions that define those borders are introduced gradually. Generally speaking, overt changes in texture or style are compositional decisions made independent of formal divisions.

The influence of the jazz model has helped determine many other decisions as well, large and small. Among these are the fact that the tempos listed in the piece are suggestions only. The temporal relationships established by the processes occurring throughout the piece are the fundamentally important elements, not the specific metronome markings given. In a way, this is similar to classical music predating the advent of the metronome—when such music played a role in those societies more closely related to the jazz of today than to the classical music of today. Also, the piece has the same "head" form of many jazz standards: the initial idea is stated and returns after a group of solos are taken. Continuing this analogy, the B and C sections can be thought of as "trading fours."

The title of this piece, *plies*, is a play on two distinct meanings of the word. First, in the sense of plying a trade, the title refers to the act of working the germ of an idea, from the gathering of basic materials to organizing and manipulating them into larger structures and finally polishing them into the final form of a piece. Second, the title



refers to the concept of two *plies*, two separate strands of material, which are twisted into one cord with the identities of the two strands being lost in the process. This two-ness stands as the fundamental identifying element of the piece. Throughout, whether it be in the two musical strands, the two forms that the piece takes on, or the two parts of the whole (the body and the coda), duality is the driver of the musical momentum from beginning to end. In fact, the duality of meaning inherent in the title itself seems appropriately self-referential.

## APPENDIX A

PITCH MATERIAL FOR EACH SCALE USED IN THE BODY OF THE PIECE

Environment 1: 19-Db

X Y Shared

1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9

Environment 2: 19-F

X Y Shared

1 2 3 4 5 6 7 8 9 1 2 3 4 5 6 7 8 9

Environment 3: 18-F

X Y Shared

1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 6

Environment 4: 18-Ab

X Y Shared

1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 6

Environment 5: 18-B

8 X Y Shared

1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 3,6

Environment 6: 18-E

8 X Y Shared

1 2 3 4 5 6 7 8 1 2 3 4 5 6 7 8 3,6

Environment 7: 13-E

X Y Shared

1 2 3 4 5 6 1 2 3 4 5 6 3,4,6

Environment 8: 13-Db

X Y Shared

1 2 3 4 5 6 1 2 3 4 5 6 3,4,6

Environment 9: 12-Db

X Y Shared

1 2 3 4 5 6 1 2 3 4 5 6 2,3,4,6

Environment 10: 12-Bb

X Y Shared

1 2 3 4 5 6 1 2 3 4 5 6 2,3,4,5,6

Note: Since the scales in Environments 9 & 10 duplicate at the octave, the collection of shared pitches is only included in one register. The pitches are shared in every octave.

## APPENDIX B

### MATRICES OF ALL POSSIBLE TRANSPOSITIONS OF EACH SCALE



### Base-19

Number of Common Tones:	9	2	4	6	2	6	5	1	7	3	3	7	1	5	6	2	6	4	2
Transposition (in semitones):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0	1	2
	5	6	7	8	9	10	11	12	13	14	15	16	17	18	0	1	2	3	4
	6	7	8	9	10	11	12	13	14	15	16	17	18	0	1	2	3	4	5
	8	9	10	11	12	13	14	15	16	17	18	0	1	2	3	4	5	6	7
	10	11	12	13	14	15	16	17	18	0	1	2	3	4	5	6	7	8	9
	11	12	13	14	15	16	17	18	0	1	2	3	4	5	6	7	8	9	10
	14	15	16	17	18	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	16	17	18	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

### Base-18

Number of Common Tones:	8	2	2	5	3	3	4	4	3	4	3	4	4	3	3	5	2	2
Transposition (in semitones):	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	1	2
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	0	1	2	3
	6	7	8	9	10	11	12	13	14	15	16	17	0	1	2	3	4	5
	9	10	11	12	13	14	15	16	17	0	1	2	3	4	5	6	7	8
	11	12	13	14	15	16	17	0	1	2	3	4	5	6	7	8	9	10
	14	15	16	17	0	1	2	3	4	5	6	7	8	9	10	11	12	13
	15	16	17	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14

### Base-13

Number of Common Tones:	6	2	1	4	3	2	3	3	2	3	4	1	2
Transposition (in semitones):	0	1	2	3	4	5	6	7	8	9	10	11	12
	3	4	5	6	7	8	9	10	11	12	0	1	2
	4	5	6	7	8	9	10	11	12	0	1	2	3
	7	8	9	10	11	12	0	1	2	3	4	5	6
	8	9	10	11	12	0	1	2	3	4	5	6	7
	10	11	12	0	1	2	3	4	5	6	7	8	9

### Base-12

Number of Common Tones:	6	2	2	5	2	2	4	2	2	5	2	2
Transposition (in semitones):	0	1	2	3	4	5	6	7	8	9	10	11
	3	4	5	6	7	8	9	10	11	0	1	2
	4	5	6	7	8	9	10	11	0	1	2	3
	6	7	8	9	10	11	0	1	2	3	4	5
	7	8	9	10	11	0	1	2	3	4	5	6
	9	10	11	0	1	2	3	4	5	6	7	8

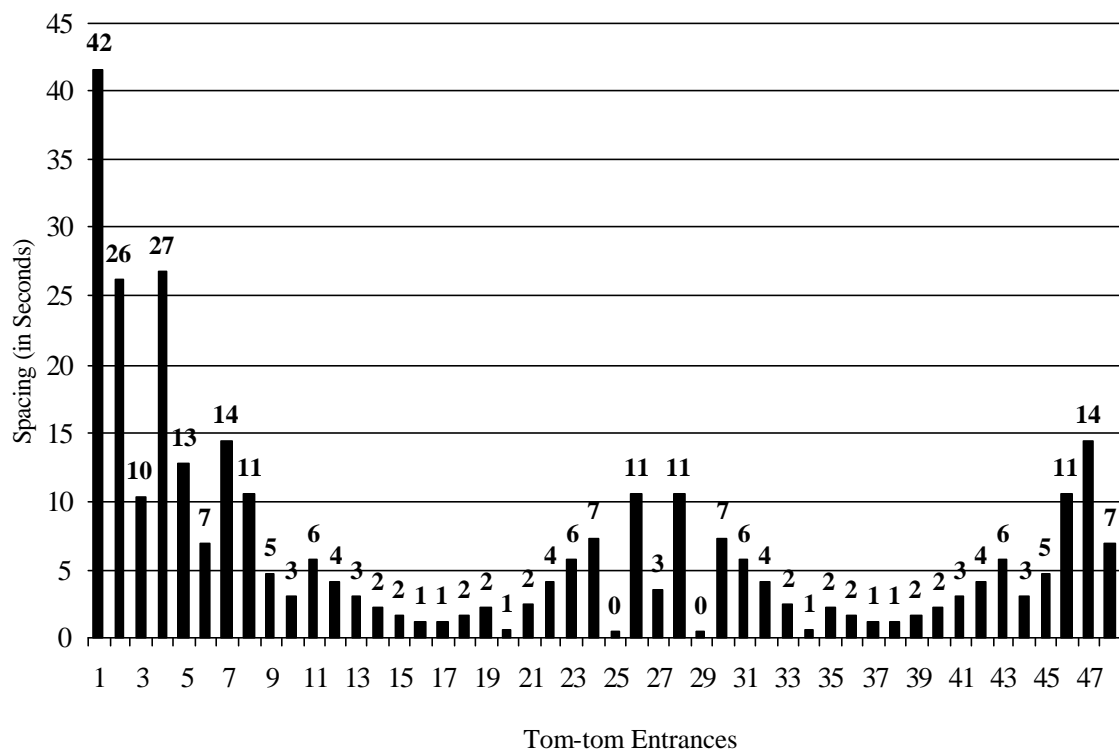
### Base-11

Number of Common Tones:	5	1	2	3	2	2	2	2	3	2	1
Transposition (in semitones):	0	1	2	3	4	5	6	7	8	9	10
	3	4	5	6	7	8	9	10	0	1	2
	4	5	6	7	8	9	10	0	1	2	3
	6	7	8	9	10	0	1	2	3	4	5
	8	9	10	0	1	2	3	4	5	6	7

The boxed columns show transpositions with the greatest number of common tones (i.e., close modulations).

## APPENDIX C

### SPACING OF TOM-TOM ENTRANCES IN SECTION A



## BIBLIOGRAPHY

Brown, Earle. *Folio* (1953).

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Carter, Elliott. *Collected Essays and Lectures, 1937-1995*, ed. Jonathan W. Bernard (Rochester: University of Rochester Press, 1997).

Discussions of rhythm, line and ensemble interaction, and the effects of these on perceived time (e.g, the essays entitled "Time Lecture," "The Rhythmic Basis of American Music" and "Two Sonatas").

Kosko, Bart. *Fuzzy Thinking: The New Science of Fuzzy Logic* (New York: Hyperion, 1993).

Presents the idea of multivalence, as opposed to bivalence, wherein event states are represented as fractional values rather than zeroes and ones.

Lindberg, Magnus. *Kraft* (1985).

Lutoslawski, Witold. *Mini Overture for Brass Quintet* (1984).

His use of stacked major 7ths inspired the use in *plies* of scales duplicating at non-octave intervals

Murray, David. *Octet Plays Trane*, David Murray Octet (Montreal: Justin Time Records, Inc., 2000).

The group's rendition of Part I of John Coltrane's *A Love Supreme* (1964) begins with a marvelous example of collective *ad libitum* as it applies to jazz music.

Riley, Terry. *In C* (1964).

Stone, Kurt. *Music Notation in the Twentieth Century* (New York: W. W. Norton & Company, 1980).

Xenakis, Iannis. *Formalized Music: Thought and Mathematics in Composition* (Bloomington: Indiana University Press, 1971).

Composition through the use of mathematical processes within musically meaningful parameters.

# *plies*

a chamber work for eleven players

duration 20 minutes

David Stecher  
2002

Score and Performance Notes

- Score in C
- Duration will vary greatly from one performance to another but generally will range between 18 to 20 minutes.
- Accidentals apply only to the note they immediately preceed. Repeated notes will have repeated acidentals. Natural signs have are used as a precaution.
- Up and down arrows on accidentals indicate quarter-tones (e.g., a quarter sharp is notated as  $\sharp$  ).
- At each cue letter, the instrument providing the cue to the ensemble is marked with a downward triangle: ▼
- This piece is constructed to be performed without a conductor. The responsibility for interpretation and performance judgments is meant to be played out among the members of the ensemble. However, if necessary, a conductor can be used if it is done so not to the detriment of the interplay between the players.
- General performance directions are used sparingly in order to allow for as much interpretive freedom as possible.
- Metronome tempo markings are only meant as suggestions.

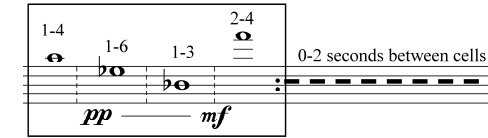
Notes on Unmetered Music

- Boxes without specific dynamic direction are to played at whatever dynamic level is prevalent at that time.
- Two dynamic markings joined by a horizontal line represent the extreme dynamic ranges for that box (e.g., *p* — *f* ). Randomly vary the dynamic level within these specified extremes. The resulting dynamic changes should be rapid and irregular unless otherwise noted.
- All durational values are notated in approximate seconds. They are meant as guides not as exact measurements.
- Numbers in square brackets represent duration of silence until the next event.
- Numbers above or below open, stemless noteheads refer to the duration these pitches are to be sustained.
- Grace note figures within boxes are to be performed very quickly.
- Boxes without any vertical dashes are to be performed in order from left to right
- When individual boxes are subdivided into separate cells by vertical dashes, these cells are to be performed in any order. There should be no pauses between cells unless otherwise noted.
- In subdivided boxes with repeat signs, play the individual cells randomly. There is no need to perform each cell once before repeating any particular cell. Along with durational directions for each cell, an overall duration will also be provided in these cases.

Examples from the score

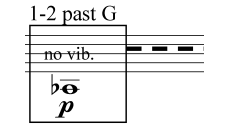
Flute, at Rehearsal Letter D

20




Saxophone, at F-36

1-2 past G



Viola, at T-22



For roughly twenty seconds, the flute randomly selects from the four cells. Not all four have to be played. Consecutive repetitions of individual cells are permitted. The duration of each note varies between the range in seconds given directly above it. Rests between cells should not exceed two seconds. The dynamic level should rapidly and irregularly vary without ever decreasing less than pianissimo or increasing greater than mezzo-forte.

Saxophone sustains the A $\flat$  for one or two seconds past Rehearsal Letter G (which is cued by the viola). The note is to be performed without vibrato at a consistent dynamic level of piano.

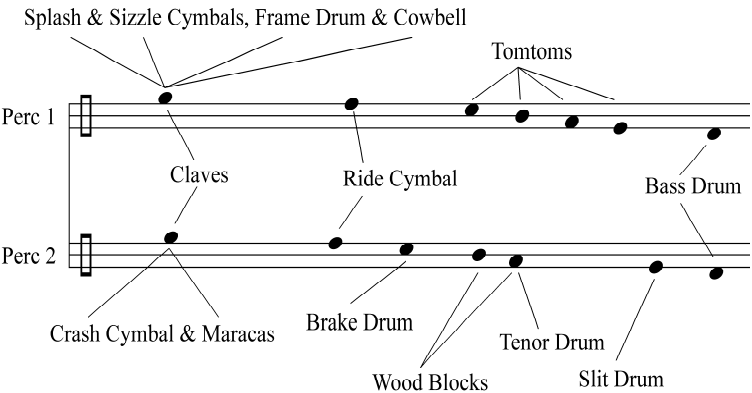
Viola plays each cell once, in either order, with two to three seconds rest between them. The dynamic level should more or less match whatever level is prevailing in the ensemble.

Ensemble

- Flute
- Clarinet in B $\flat$
- Alto Saxophone in E $\flat$
- Trumpet in B $\flat$  (harmon mute, bucket mute, hat)
- Trombone (harmon mute, bucket mute, plunger)
- Percussion 1
- Percussion 2
- Violin
- Viola
- Violoncello
- Contrabass

Percussion Battery

Percussion 1	Percussion 2	Shared Percussion
4 Tomtoms	Tenor Drum	Bass Drum
Frame Drum	Slit Drum	Claves
Splash Cymbal	2 Wood Blocks	Ride Cymbal
Sizzle Cymbal	Maracas	
Cowbell	Crash Cymbal	
	Brake Drum	



Percussion Notations

- Dead Stick
- Rim Shot
- On Rim of Drum
- Let Vibrate
- Dome
- Edge

Score in C

*plies*

David Stecher  
(2002)

**Flute**

**B♭ Clarinet**

**E♭ Alto Saxophone**

**B♭ Trumpet**

**Trombone**

**Percussion 1**

**Percussion 2**

**Violin**

**Viola**

**Violoncello**

**Contrabass**

**Section A**

**Section B**

**Section A-1**

**Section A-3**

**Section B-1**

**Section B-3**

**Section B-5**

**Section B-7**

**Section A-2**

**Section A-4**

**Section A-5**

**Section A-6**

**Section A-7**

**Section A-8**

**Section A-9**

**Section A-10**

**Section A-11**

**Section A-12**

**Section A-13**

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**Section A-240**

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**Section A-244**

**Section A-245**

<

C

Score for Percussion and Strings, featuring various instruments and dynamic markings.

**Flute 1 (Fl):** [15-20] *p* < *mf* (5-8)

**Clarinet 1 (Cl):** *fp*, *mf*, *f*, *p* (7, no vib.), *mp* (espressivo)

**Saxophone (Sax):** [2], *mp*, *f*, *p* (1, 2-3, 3, 2, 1), *p* (espressivo)

**Trumpet (Tpt.):** [10-15], *p* (8-10), [10-15]

**Trombone (Tbn):** [10-15], *pp*, *mp* (2-6, 2-6, 1-3, 1-5 seconds between cells)

**Percussion 1 (Prc 1):** *mp*

**Percussion 2 (Prc 2):** [10-15], Slit Drum (drumsticks), *p* (4-6), [1], Crash, *mp* (1, 1, 1), *mp*

**Violin (Vln):** [1], 2, 6, 8, *p* (senza vib.)

**Viola (Vla):** [2-8], *f*, *f*, *f* (2, 4), *mp* < *f*, *mp* < *f*

**Violoncello (Vlc):** [2-5], *mf* (1, 2), 10 seconds between cells

**Bass:** [0-5], *mp* (sul A), pizz, arco, *mf* (3, 1, 3-4, 8, 4), spaced over 50-60 seconds

Dynamic markings: *pp*, *mp*, *f*, *mf*, *p*, *fp*, *espressivo*, *senza vib.*

Rehearsal marks: C-1, C-3, C-5, C-7, C-9, C-11



Score for a chamber ensemble, featuring parts for Flute 1 (F1), Clarinet 1 (Cl), Saxophone (Sax), Trumpet (Tpt.), Trombone (Tbn), Percussion 1 (Prc 1), Percussion 2 (Prc 2), Violin (Vln), Viola (Vla), Violoncello (Vlc), and Bass.

The score is divided into measures, with specific performance instructions and dynamics marked throughout.

**Flute 1 (F1):** Measures 5-10. Dynamics: *mp*, *mf*, *p*, *mf*, *mp*.

**Clarinet 1 (Cl):** Measures 1-10. Dynamics: *mp*, *mf*, *p*, *mf*, *mp*.

**Saxophone (Sax):** Measures 1-10. Dynamics: *p*, *mf*, *mp*.

**Trumpet (Tpt.):** Measures 1-10. Dynamics: *mf*, *p*.

**Trombone (Tbn):** Measures 1-10.

**Percussion 1 (Prc 1):** Measures 1-10. Dynamics: *mf*, *p*, *mf*.

**Percussion 2 (Prc 2):** Measures 1-10.

**Violin (Vln):** Measures 1-10. Dynamics: *mp*, *f*, *mp*, *mp*, *p*, *mp*, *p*, *mp*, *p*.

**Viola (Vla):** Measures 1-10. Dynamics: *mp*, *f*, *mp*, *mp*, *p*, *mp*, *p*, *mp*, *p*.

**Violoncello (Vlc):** Measures 1-10. Dynamics: *mp*, *p*, *mp*, *p*, *mp*, *p*.

**Bass:** Measures 1-10.

**Performance Instructions:**

- 4-5 past D
- 8-10
- 4-5
- quasi-pont.
- 0-3 seconds between cells
- 10-15
- 1-5 seconds between repetitions
- ( : )

Score for a jazz ensemble, featuring a variety of instruments and dynamic markings. The score is divided into two main sections, *poco rallentando* and *a tempo*, separated by a vertical line.

**Instrumentation:** Flute (Fl), Clarinet (Cl), Saxophone (Sax), Trumpet (Tpt.), Trombone (Tbn), Percussion 1 (Prc 1), Percussion 2 (Prc 2), Violin (Vln), Viola (Vla), Violoncello (Vlc), and Bass.

**Key Performance Instructions:**

- Flute (Fl):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-4, 1-6, 1-3, 2-4, and a note "0-2 seconds between cells".
- Clarinet (Cl):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".
- Saxophone (Sax):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-4, 1-6, 1-3, 2-4, and a note "0-2 seconds between cells".
- Trombone (Tbn):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".
- Percussion 2 (Prc 2):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".
- Violin (Vln):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".
- Viola (Vla):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".
- Violoncello (Vlc):** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".
- Bass:** *poco rallentando* to *a tempo*. Includes a box with fingerings: 1-5, 1-2, 2-4, 1-5, and a note "0-5 seconds between cells (do not repeat last cell)".

**Dynamic Markings:** *pp*, *mf*, *p*, *mp*, *f*, *senza vib.*

**Rehearsal Marks:** C-25, C-27, D-1, D-3, D-5, D-7.

\* Tbn & Bass: Overall trend is to increase the duration of rests between cells

to E

2-6 2-6 2-4 1-5

pp mf

0-4 seconds between cells (with occasional fluttertonguing during quieter sections)

15 3-5 3-5 0-2 seconds between cells

p mp

5 into hat

p

hat open

mp

< mf < fp

mf

3

p mf pp

5-7 8-10

mp p-f

p mf

f (subito) mf

mf

1-2

p mf

10-12

D-9 D-11 D-13 D-15 D-17 D-19

Score for Percussion and Strings, measures D-21 to D-29.

**Percussion:**

- Prc 1:** Snare drum. Measures D-21 to D-29. Dynamics: *mp*, *p*, *p* < *mp*, *p*, *mp*, *p* < *mp*.
- Prc 2:** Tenor Drum (wire brushes). Measures D-21 to D-29. Dynamics: *pp*, *mp*. Includes a box for "3 past F" and "2-6 seconds between bursts".

**Strings:**

- Vln:** Violins. Measures D-21 to D-29. Dynamics: *mf*, *p*, *p*, *mp*, *p*, *mp*. Includes a box for "3 past F" and "2-6 seconds between bursts".
- Vla:** Viola. Measures D-21 to D-29. Dynamics: *p*, *mp*, *mf*. Includes a box for "3 past F" and "2-6 seconds between bursts".
- Vlc:** Violoncello. Measures D-21 to D-29. Dynamics: *p*, *mp*. Includes a box for "3 past F" and "2-6 seconds between bursts".
- Bass:** Double Bass. Measures D-21 to D-29. Dynamics: *p*, *mp*. Includes a box for "3 past F" and "2-6 seconds between bursts".

**Other Instruments:**

- F1:** Flute 1. Measures D-21 to D-29. Dynamics: *mp*, *p*, *mp*.
- C1:** Clarinet 1. Measures D-21 to D-29. Dynamics: *mp*, *p*, *mp*.
- Sax:** Saxophone. Measures D-21 to D-29. Dynamics: *p*, *mp*. Includes a box for "3 past F" and "2-6 seconds between bursts".
- Tpt:** Trumpet. Measures D-21 to D-29. Dynamics: *mp*, *p*, *mp*.
- Tbn:** Trombone. Measures D-21 to D-29. Dynamics: *mp*, *p*, *mp*.

**Rehearsal Markers:**

- D-21
- D-23
- D-25
- D-27
- D-29

E

Score for E section, measures 31-37.

**Flute 1 (F1):** Measures 31-32: *espressivo* 4-5, *mp* *poco*. Measure 33: *p* < *mf* > *p* (4-5, 3). Measure 34: *mp*. Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Clarinet 1 (Cl):** Measures 31-32: *mp* *poco*. Measure 33: *mp*. Measure 34: *p* < *mf* > *p* (3, 3). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Saxophone (Sax):** Measures 31-32: *mp* *poco*. Measure 33: *mp*. Measure 34: *p* < *mf* > *p* (5). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Trumpet (Tpt.):** Measures 31-32: *mf*. Measure 33: *mp*. Measure 34: *p* < *mp* > *p* (1-3, 1). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Trombone (Tbn):** Measures 31-32: *mf*. Measure 33: *p* *fp* *fp* (2, 2, 2). Measure 34: *p* < *mf* > *p* (3). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Trumpet 1 (Tpt. 1):** Measures 31-32: *mf*. Measure 33: *mp*. Measure 34: *p* < *mp* > *p* (1-3, 1). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Trumpet 2 (Tpt. 2):** Measures 31-32: *mf*. Measure 33: *mp*. Measure 34: *p* < *mp* > *p* (1-3, 1). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Violin (Vln):** Measures 31-32: *mp*. Measure 33: *mp*. Measure 34: *p* < *mf* > *p* (4-8, 1-3). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Viola (Vla):** Measures 31-32: *mp*. Measure 33: *mp*. Measure 34: *p* < *mf* > *p* (4-8, 1-3). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Violoncello (Vlc):** Measures 31-32: *mp*. Measure 33: *mp*. Measure 34: *p* < *mf* > *p* (4-8, 1-3). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Bass:** Measures 31-32: *mp*. Measure 33: *mp*. Measure 34: *p* < *mf* > *p* (3-4, 6-8, 1-2). Measure 35: *mp*. Measure 36: *mp*. Measure 37: *mp*.

**Chord Progression:** D-31, D-33, D-35, E-1, E-3, E-5, E-7.

Score for a full orchestra, featuring woodwinds, brass, percussion, strings, and bass. The score is divided into measures, with a key signature change to F major indicated by a large 'F' in a box. The tempo is marked 'a little faster'.

**Woodwinds:**

- Flute 1 (F1):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Clarinet 1 (C1):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Saxophone (Sax):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.

**Brass:**

- Trumpet (Tpt.):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Trombone (Tbn):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.

**Percussion:**

- Percussion 1 (Prc 1):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Percussion 2 (Prc 2):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.

**Strings:**

- Violin (Vln):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Viola (Vla):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Violoncello (Vlc):** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.
- Bass:** Starts with a forte (*f*) melody, then moves to mezzo-forte (*mf*) and forte (*f*) in the second system.

**Performance Notes:**

- Tempo:** 'a little faster' (indicated by a box with 'a little faster').
- Key Signature:** F major (indicated by a large 'F' in a box).
- Rehearsal Markers:** E-9, F-1, F-3, F-5, F-7.
- Section Markers:** 3-4, 3-5, 4-5, 6-8, 8-10, 10-20, 15-20.
- Dynamic Markings:** *f* (forte), *mf* (mezzo-forte), *p* (piano).
- Articulation:** Accents, slurs, and breath marks are used throughout the score.
- Other:** 'to F-13' (Tpt.), '1-5 seconds between cells' (Tpt.), '1 second between cells' (Vln), 'Ride (on dome)' (Prc 2), '(ord) Crash' (Prc 2).

[illegible]

F1  
 C1  
 Sax  
 Tpt.  
 Tbn  
 Perc 1  
 Perc 2  
 Vln  
 Vla  
 Vlc  
 Bass

1-2 1-2 0-1 seconds between cells  
*pp* < *mf* *pp* < *mf*  
 1-4 1-4 1-4 1-4 0-4 seconds between cells  
*p* *mf*  
 1-3 6-8  
*p* *fl.* *mp*  
 2-3 Ride & Crash \* 25-30 2-5 seconds between cells  
 aggressively *mf* 1  
 1-4 1-4 0-1 seconds between cells  
*p* *mp*  
 2 4-6 1-2  
*mp* < *f* > *p*  
 5 4 1-2  
 F-19 F-21 F-23 F-25 F-27

- \* Percussion 2: Randomly vary location of strikes on cymbals
- † Flute: Overall trend is to decrease the duration of rests between cells



Score for F1, Cl, Sax, Tpt., Tbn, Perc 1, Perc 2, Vln, Vla, Vlc, and Bass.

**F1:** *mf* > (4)

**Cl:** *p*, *mp*, (accelerating), *mp*, *mf*, 1 past G, *p* (no vib.)

**Sax:** *p* (no vib.), *mp*, 1-2 past G, *p* (no vib.)

**Tpt.:** *fp*, *fp*, *mp*, *mf*, 3

**Tbn:** 1, 2-5, 1-5, 4-7, 1

**Perc 1:** *mp*, *p*, *mf*, *mp*

**Perc 2:**

**Vln:** *mp*, *p*, *mf*, 3

**Vla:** *pp*, *mp*, *fp*, *pp*, *mp*, *p*

**Vlc:** *mp*, 1-3, 2-3, 2-3, 1-2

**Bass:** 2-3, 2-4 past G, 1-6, *mf* > *p*, without pause, gradually more ponticello

Rehearsal marks: F-29, F-31, F-33, F-35, F-37

12



△ | | |

F1

Cl

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

Slit Drum & Wood Blocks (hard mallets)

*mp*

H-3 H-5 H-7 H-9 H-11

Fl

Cl

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

fluttertongue

*p*

Claves

*p*

*p*

*p*

*p*

*mp*

H-13

H-15

H-17

H-19

H-21

\* Strings (from here to M): legato, rapid passages using the specified pitches.  
 Avoid any semblence of rhythm or pulse, holding no note for more than 1 second.  
 Conjunct motion almost exclusively.  
 Dynamic level never more than mp.

Score for Percussion and Bass:

**Percussion:**

- Frame Drum:** *p*, *mp*, *p*, *mp*, *p*, *mp*
- Claves:** *p*

**Bass:**

- mf** (H-23)
- p** (H-25)
- H-27**
- H-29**
- H-31**

**Violins (Vln):** mute on 10

**Viola (Vla):** 5-8

**Violoncello (Vlc):** 5-8 past I

I

[illegible]

I-15



J

1-17 1-19 1-21 J-1 J-3

F1

C1

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

*mp*

*mp*

*mp*

*mf*

*f*

*p*

*f*

15

1 past J

[ 20 ]

20

4-5

4-5

mf (subito)

mp

mp

mf

5-10 after clarinet entrance

Splash (brush handles)

Ride

Slit Drum

mp

p

12-15

4-5

15

12

18-20

ord

mp

5

5

J-15

J-17

J-19

J-21

J-23

Score for measures 25-33, featuring various instruments and percussion.

**Flute 1 (F1):** Measures 25-27:  $mf$ , 5th finger. Measures 28-30:  $mf$ , 5th finger. Measures 31-33: 5th finger.

**Clarinet 1 (Cl):** Measures 25-27:  $mf$ , 3rd finger. Measures 28-30:  $mf$ , 3rd finger. Measures 31-33: 5th finger.

**Saxophone (Sax):** Measures 25-27:  $mf$ , 5th finger. Measures 28-30: 5th finger. Measures 31-33: 5th finger.

**Trumpet (Tpt.):** Measures 25-27:  $mf$ , 5th finger. Measures 28-30: 5th finger. Measures 31-33: 5th finger.

**Trombone (Tbn):** Measures 25-27: bucket mute. Measures 28-30: 1-2 past K. Measures 31-33: same as strings.

**Percussion 1 (Prc 1):** Measures 25-27: 2/4, 9/16, 4/4. Measures 28-30: 2/4, 9/16, 4/4. Measures 31-33: 2/4, 9/16, 4/4.

**Percussion 2 (Prc 2):** Measures 25-27: Maracas (swirling). Measures 28-30: 5-6 past K. Measures 31-33: 5-6 past K.

**Violin (Vln):** Measures 25-27: 5 past K. Measures 28-30: 5 past K. Measures 31-33: 5 past K.

**Viola (Vla):** Measures 25-27: 8-10. Measures 28-30: 8-10. Measures 31-33: 8-10.

**Violoncello (Vlc):** Measures 25-27: 7-8. Measures 28-30: 7-8. Measures 31-33: 7-8.

**Bass:** Measures 25-27:  $mf$ , 5th finger. Measures 28-30: 5th finger. Measures 31-33: 5th finger.

Measure numbers: J-25, J-27, J-29, J-31, J-33.

K

Fl

Cl

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

J-35

J-37

K-1

K-3

K-5

K-7

Tom-toms  
rim shot  
*mp*  
on the rim

20

6-8

8

4-5

15

3

8-10

2-3

8-10

Score for a jazz ensemble, featuring the following instruments and parts:

- F1** (First Flute): Melodic line with triplets and slurs, marked *mp*.
- C1** (First Clarinet): Silent part.
- Sax** (Saxophone): Solo line starting at measure 6-8, marked *mp*.
- Tpt.** (Trumpet): Silent part.
- Tbn** (Trombone): Solo line starting at measure 6-7, marked *mp*.
- Pre 1** (Percussion 1): Silent part.
- Pre 2** (Percussion 2): Silent part.
- Vln** (Violin): Melodic line with triplets and slurs, marked *mp*. Includes a "mute off" instruction.
- Vla** (Viola): Solo line starting at measure 10, marked *mp*.
- Vlc** (Violoncello): Solo line starting at measure 15, marked *mp*.
- Bass**: Bass line with pizzicato and arco markings, marked *mp*. Includes a "pizz" instruction.

Key signatures and time signatures are indicated throughout the score. The score includes various musical notations such as triplets, slurs, and dynamic markings.



L-1



Fl 1: *mp*, *p*, [1-2] *ppp* (Section M), [2-3] (Section N)  
 Cl 1: [1-2] *ppp*  
 Sax: *p*, [1-2] *ppp*  
 Tpt.: *mp*, *mp*, [1-2] *ppp*  
 Tbn: *p*, *mp*, *espressivo*, [1-2] *ppp*, *p*  
 Perc 1: *p* (*subito*), ord, edge, dome, [4-6] Splash (bowed) *ppp*, [3] Bass Drum *ppp*  
 Perc 2: [5-7] Ride (soft mallets) on edge *ppp*, [1-2], [6-8] Tenor Drum (soft mallets) *pp*  
 Vln: 2, *mp*, *espressivo*, mute off, 3, [1-2] *ppp*, [8]  
 Vla: to M, [1-2] *ppp*, [15-18]  
 Vlc: [1-2] *ppp*  
 Bass: [1-2] *ppp*

\* Section M: Randomly repeat the specified pitches. Each attack should be spaced 1-3 seconds apart. Gradually reduce the duration of each note so that by the end of the section only staccato notes remain.  
 † Section N: Same as in section M, only now staccato.

28

2-3 3 2-3

F1

Cl

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

*pp*

*niente*

*p*

*p*

*p*

*p*

*p*

*mp*

*mp*

soft mallets

Tenor Drum

*niente*

2-3 1-2 2 2 3-4 5

N-3 N-5 N-7 N-9 N-11 N-13

N-27

## O

The musical score for "The Great Wall" by John Williams is presented in a standard orchestral format. The score includes parts for the following instruments:

- Flute (Fl):** Features a melodic line with dynamic markings *n* (normal), *mf* (mezzo-forte), and *n* (normal).
- Clarinet (Cl):** Plays a rhythmic pattern with a triplet of eighth notes.
- Saxophone (Sax):** Features a melodic line with dynamic markings *n* (normal), *mf* (mezzo-forte), and *n* (normal).
- Trumpet (Tpt):** Features a melodic line with dynamic markings *mf* (mezzo-forte) and *n* (normal).
- Trombone (Tbn):** Features a melodic line with dynamic markings *mf* (mezzo-forte) and *n* (normal).
- Percussion (Prc 1, Prc 2):** Features a rhythmic pattern with dynamic markings *p* (piano) and *f* (forte).
- Violin (Vln):** Features a melodic line with dynamic markings *n* (normal), *mp* (mezzo-piano), and *n* (normal).
- Viola (Vla):** Features a melodic line with dynamic markings *p* (piano), *f* (forte), and *mf* (mezzo-forte).
- Violoncello (Vlc):** Features a melodic line with dynamic markings *p* (piano), *f* (forte), and *mf* (mezzo-forte).
- Bass:** Features a melodic line with dynamic markings *p* (piano), *f* (forte), and *mf* (mezzo-forte).

The score includes various musical notations such as notes, rests, and dynamic markings. The key signature is one sharp (F#) and the time signature is 4/4. The score is divided into measures, with some measures containing multiple notes and rests. The score is presented in a standard orchestral format, with the instruments arranged in a traditional manner.

P

8<sup>me</sup>

F1

C1

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

mf

mp

temporal swells lasting 4-8 seconds each

3-4 past Q

Claves

10-12

8

4-6

4-5

5-6

3

3

3

3-4

4-5

3

2-3

Splash

mp

f

5

2

P-7

P-9

P-11

P-13

P-15

P-17

Q

Fl

Cl

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

*p*

*mp*

harmon stem out

1-2

1

1-2

6-8

*legato (warmly)*

*p*

5-6

(stem in)

*mp*

*espressivo*

*mp*

2

2-3

1 past R

Q-1

Q-3

Q-5

Q-7

Q-9

Q-11





**S**

R-19

**T** *faster*  
♩=168

F1

C1

Sax

Tpt.

Tbn

▼

Prc 1

Prc 2

*faster*  
♩=168

Vln

Vla

Vlc

Bass

T-1

T-3

T-5

T-7

T-9

T-11

T-13

T-15

Fl

Cl

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

5

*mf* > *mf* > *mf* > *mf* > *mf* >

*mf* *f* *f* *f* *f*

*mf* *f*

*mp* *mf* > *mf* > *mf* > *p* < *f*

Bass Drum

*p* < *mf* *p* < *mf*

*p* < *mf* *f*

3-4 2-3 3 2-5 seconds between cells

3 6-7 2-3 seconds between cells

ord → → → → → s.p. ord ord ord → → → → → s.p. → → ord

*f* *sfz* *fp* *f* *fp* < *mf* >

T-17 T-19 T-21 T-23 T-25 T-27 T-29

to T-40

2-5 2-5

*f*

*n* *f*

*f*

4-5 1-2 2-4 2-3 brief pauses between cells (no more than 1 second)

*f*

*f*

*f*

*mp* *f* *p* *f*

*f*

2-3 2-3 2-3 0-2 seconds between cells

*p* < *f* *p* < *f* *p* < *f*

*f*

2 1-2 3-4 4-5

*f* pizz (let ring) arco pizz

T-31 T-33 T-35 T-37 T-39 T-41

[illegible]

Score for a large ensemble, featuring woodwinds, brass, strings, and percussion. The score is written for 12 staves, including Flute 1 (Fl), Clarinet 1 (Cl), Saxophone (Sax), Trumpet (Tpt), Trombone (Tbn), Percussion 1 (Prc 1), Percussion 2 (Prc 2), Violin (Vln), Viola (Vla), Violoncello (Vlc), and Bass.

The score is divided into measures, with various musical notations including notes, rests, and dynamic markings. Key markings include *mp* (mezzo-piano), *mf* (mezzo-forte), *p* (piano), *f* (forte), and *sfz* (sforzando). The score also includes performance instructions such as "senza vib." (without vibrato) and "sustain last note until next entrance in U-3".

The score is marked with rehearsal cues: T-55, T-57, T-59, T-61, T-63, and T-65. The score is written in 4/4 time, with various key signatures and tempo markings.

**U**

**Flute 1 (Fl):** Measures 67-71 and U-1 to U-9. Includes a box labeled "to U-3" with notes 0-2 and 0-2. Dynamics: *mf*, *f*, *mp*, *f*. Articulation: *fluttertongue*.

**Clarinet (Cl):** Measures 67-71 and U-1 to U-9. Includes a box with notes 2-3 and 1. Dynamics: *f*, *mp*, *f*.

**Saxophone (Sax):** Measures 67-71 and U-1 to U-9. Includes a box with notes 2-3. Dynamics: *mf*, *f* (subito), *mp*.

**Trumpet (Tpt.):** Measures 67-71 and U-1 to U-9. Includes a box with notes 2, 2, 2. Dynamics: *f* (subito), *mp*, *f*.

**Trombone (Tbn):** Measures 67-71 and U-1 to U-9. Dynamics: *mf*, *f* (subito), *mp*, *f*.

**Percussion 1 (Prc 1):** Measures 67-71 and U-1 to U-9. Dynamics: *mp*, *mf*, *p*, *mp*, *f*.

**Percussion 2 (Prc 2):** Measures 67-71 and U-1 to U-9.

**Violin (Vln):** Measures 67-71 and U-1 to U-9. Dynamics: *f* (subito), *sfz*, *mp*.

**Viola (Vla):** Measures 67-71 and U-1 to U-9. Includes a box labeled "12-15" with notes (1) and a performance instruction: "begin about 2 sec. duration, then rapidly accelerate".

**Violoncello (Vlc):** Measures 67-71 and U-1 to U-9. Dynamics: *f*, *mp*, *f*.

**Bass:** Measures 67-71 and U-1 to U-9. Dynamics: *sfz*, *mp*, *sfz*.

**Section Markers:** T-67, T-69, T-71, U-1, U-3, U-5, U-7, U-9.

42



Score page 43, featuring measures V-1, V-3, W-1, W-3, X-1, and X-3. The score is divided into three systems, each marked with a large letter (V, W, X) and a tempo change from *molto rit.* (120 bpm) to 60 bpm.

**Instrumentation and Parts:**

- Fl (Flute):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Cl (Clarinet):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Sax (Saxophone):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Tpt. (Trumpet):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Tbn (Trombone):** Bass clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Prc 1 (Percussion 1):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Prc 2 (Percussion 2):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Vln (Violin):** Treble clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Vla (Viola):** Bass clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Vlc (Violoncello):** Bass clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.
- Bass:** Bass clef, 4/4 time. Part V-1, V-3, W-1, W-3, X-1, X-3.

**Tempo and Dynamics:**

- Tempo:** *molto rit.* (120 bpm) to 60 bpm.
- Dynamics:** *fff* (fortissimo) and *poco* (poco).

**Rehearsal Markers:**

- V-1:** Measure 1 of System V.
- V-3:** Measure 3 of System V.
- W-1:** Measure 1 of System W.
- W-3:** Measure 3 of System W.
- X-1:** Measure 1 of System X.
- X-3:** Measure 3 of System X.





*poco rit.* — — — — — ♩ = 70-80

F1

C1

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

(slight bend upward)

BB-5

BB-7

BB-9

BB-11

BB-13

BB-15

3-6

30-40

3

pp < mf

ord

1-4

pp < mf

mf

3

(1)

5

pp < mf

ord

4 5-7

mf

Strings: Wide, exaggerated vibrato of varying speeds. Glissandi are outgrowths of this vibrato. Bow changes should be accented heavily during moments of maximum dynamic level (mf).

The musical score is arranged for the following instruments:

- Fl 1**: Flute 1, Treble clef. Includes a measure with a whole note, dynamic *mp*, and a box containing the number 4. A later measure has a whole note, dynamic *f*, and a box containing 4-6.
- C1**: Clarinet 1, Treble clef.
- Sax**: Saxophone, Treble clef. Includes a measure with a quarter note, dynamic *mp*, and a box containing > > > 2. A later measure has a quarter note, dynamic *mp*, and a box containing 1-2.
- Tpt.**: Trumpet, Treble clef.
- Tbn**: Trombone, Bass clef.
- Prc 1**: Percussion 1, Treble clef.
- Prc 2**: Percussion 2, Treble clef. Includes a measure with a whole note and a box containing 1-2.
- Vln**: Violin, Treble clef. Includes a measure with a whole note, dynamic *mf*, and a box containing 3. A later measure has a whole note, dynamic *pp* to *mf*, and a box containing to CC \*.
- Vla**: Viola, Bass clef. Includes a measure with a whole note, dynamic *pp* to *mf*, and a box containing to CC \*.
- Vlc**: Violoncello, Bass clef. Includes a measure with a whole note, dynamic *pp* to *mf*, and a box containing to CC \*.
- Bass**: Bass, Treble clef.

A vertical line labeled **CC** (Coda) is positioned at the beginning of the second system. A dashed vertical line is positioned at the end of the second system.

\* Continue ad libitum within the specified range



4-5 4 3 3-4

*mp* < *f* > *mp* < *f*

FF

10

*f* *mp*

GG

[10-12]

*p*

2-3

[4-6]

[2-3]

[5-9]

[5-9]

5-6

*sfz*

*p* — *mf*

(1) to FF

Splash

*p* — *f*

[3-5]

Tom-toms

2-4 seconds between cells

[10-15]

[10]

ord. (Subdued)

*p* — *mp*

ord. (Subdued)

*p* — *mp*

ord. (Subdued)

*p* — *mp*

more intensely, quasi-pont.

10

*p* — *f*

more intensely, quasi-pont.

10

*p* — *f*

more intensely, quasi-pont.

10

*p* — *f*

[8-10]

Fl

C1

Sax

Tpt.

Tbn

Prc 1

Prc 2

Vln

Vla

Vlc

Bass

HH

4-6

*p* — *mf*

*mf* > *ppp*

*mf* > *ppp*

5-8

*sfz*  
*p* — *mf*

*mp* > *ppp*

1-2 10-15  
(*z* • )

*mp* > *ppp*

*mp*

*mf*

poco a poco sul tasto

*mp* > *ppp*

poco a poco sul tasto

*mp* > *ppp*

poco a poco sul tasto

*mp* > *ppp*

sul tasto

*mp* > *ppp*

2-5

\* Randomly play any pitch within the specified range holding each note no longer than two seconds.  
Immediate glissando downward after each attack.